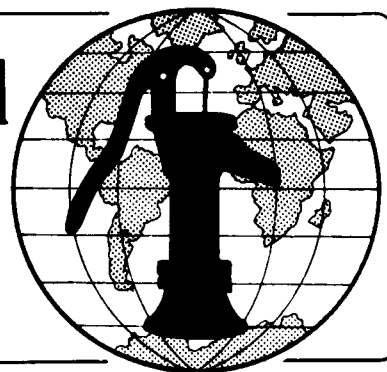


Water for the World

Maintaining Structures for Springs Technical Note No. RWS. 1.0.1



Spring structures are easy to operate and maintain. One of the main advantages of springs as water sources is that they are inexpensive to develop. The structures needed to protect them require little attention after installation. No structure, however, is completely maintenance free. Even the most simply designed spring structure needs periodic maintenance to

ensure that it provides good quality water in sufficient quantities. This technical note describes the periodic maintenance needed for spring boxes and seep collection systems so that they operate effectively for many years.

Useful Definitions

EROSION - The wearing away of soil, rock or other material by the flow of water.

PERVIOUS - Allowing liquid to pass through.

SEDIMENT - Small particles of dirt and other matter that settle to the bottom of water.

TURBIDITY - Cloudiness in water caused by particles of suspended matter.

Maintenance of Spring Boxes

The maintenance of spring boxes requires that a check be made to ensure that the structure adequately protects the water source and that all available water is being collected. Examine the spring box periodically to ensure that there is no silt build-up and that water quality is good. Study the following conditions at the site to ensure that the spring is well-protected and free from any operating problems.

Determine whether the diversion drainage ditch above the spring is doing an adequate job of removing surface water from the area. If not, the trench should be improved. The diversion ditch should be lined with gravel or stones to increase flow and to prevent erosion of the sides. Grass can be planted in the trench to prevent erosion, but heavy growth will block flow. Be sure to check the diversion ditch periodically to make sure that grass is not too high and that no other obstructions will block water flow.

If there is a fence above the spring, make sure it is in good repair and is effectively keeping animals away from the spring.

Check the upslope wall to be sure it is solid and erosion is not wearing it away. If there are signs of heavy erosion or settling, add additional back-fill of top soil, clay or gravel. Build up the hill with stones and plant grass to help control erosion around the spring box.

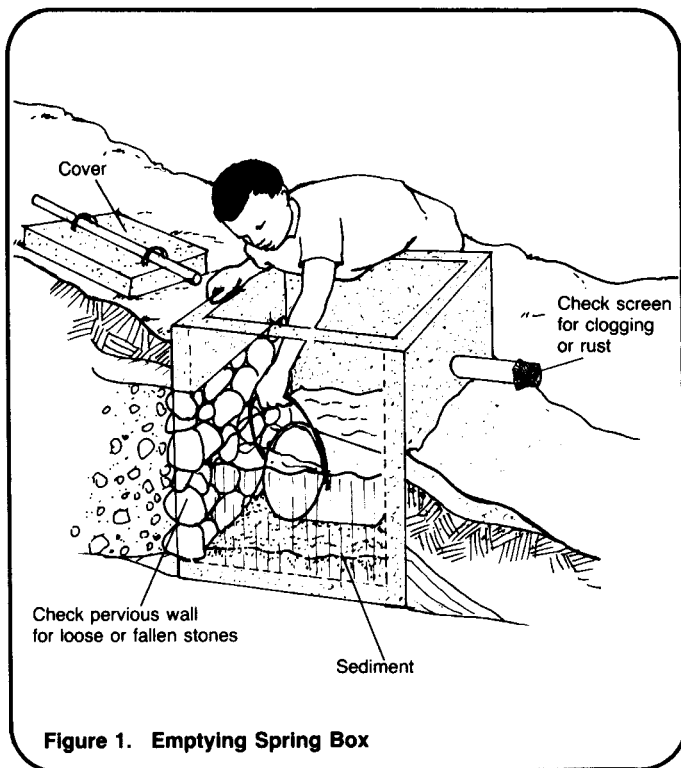
Check the water. If there is an increase in turbidity or flow after a rainstorm, surface run-off is reaching the source and contaminating it. Identify the source of the run-off and improve the protection of the spring.

Take periodic samples of the water and have them analyzed to check for evidence of fecal contamination. Information on taking a water sample and analyzing it can be found in "Taking a Water Sample," RWS.3.P.2 and "Analyzing a Water Sample," RWS.3.P.3.

Check the cover to be sure the box is watertight. Make sure that the cover is not removed by the users and that contamination is not being introduced by people dipping buckets and other utensils into the spring box.

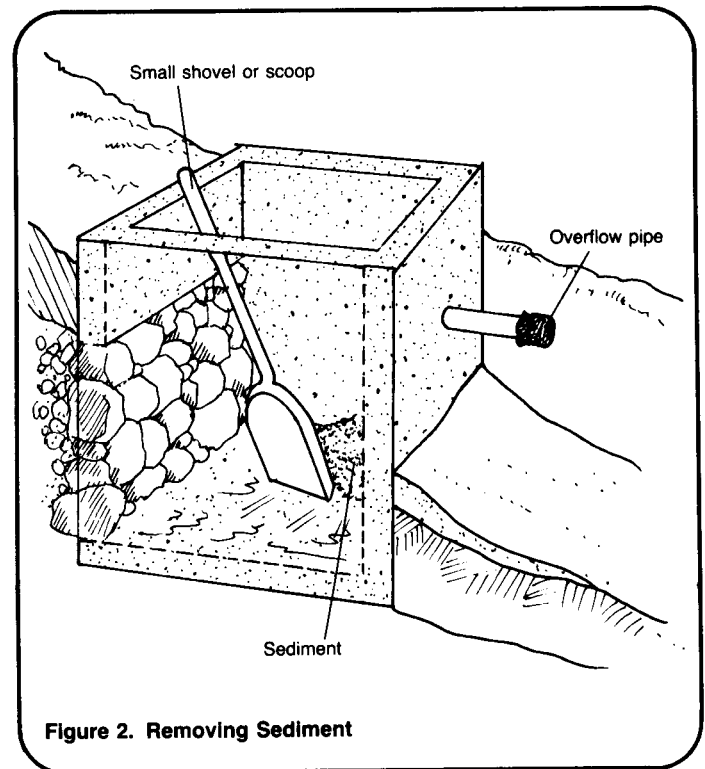
Determine that all available water is being collected by the system. Watch out for water seeping from the sides or from underneath the spring box. If water seeps out, seal the leak with clay or concrete so that all flow is diverted into the spring box.

Ensure that the system is cleaned adequately. Once a year disinfect the system and clean the sediment out of the spring box. To clean the system, remove the cover. Allow the water to drain from the spring box by opening the valve on the outlet pipe. If the box has only one pipe for outlet and overflow, use a bucket to empty the spring box as shown in Figure 1. Then use a small shovel to clean out the sediment collected on the bottom of the tank. Sediment removal will prevent clogging and build-up which causes the tank to fill up more quickly.



If a pump is built into the spring box to collect sediment, a drain pipe can be installed to carry sediment away. The drain pipe should have a valve. This type of installation is especially useful when tapping a fast flowing spring.

After cleaning the tank, follow the procedures for disinfection explained in "Disinfecting Wells," RWS.2.C.9. All walls of the spring box should be washed with a chlorine solution and chlorine should be put directly into the water. If possible, the chlorine should be allowed to stand for 24 hours. If the chlorine cannot stand that long, apply two doses of chlorine twelve hours apart to ensure complete disinfection. Figures 1, 2, and 3 show the cleaning and disinfection of a spring box.



Check the screening on the pipes to see if cleaning is necessary. If screens are clogged or very dirty, they should be either cleaned or changed. Always use copper or plastic screening to prevent rust.

Maintenance of Seep Collection Systems

Operating and maintaining seep collection systems is similar to spring boxes except that extra care must be taken in the maintenance of the collection pipes. Although collection pipes are lined with gravel to filter out sediment, the pipes can still clog.

If clogging occurs, substantially less water will reach the collection box. If water flow decreases, suspect that the collection system is clogged.

To clean the clogged pipes, remove the cap from the clean-out pipe and pour water into it. Use either a hose or a bucket so that sufficient force is available to break up the sediment. See Figure 4.

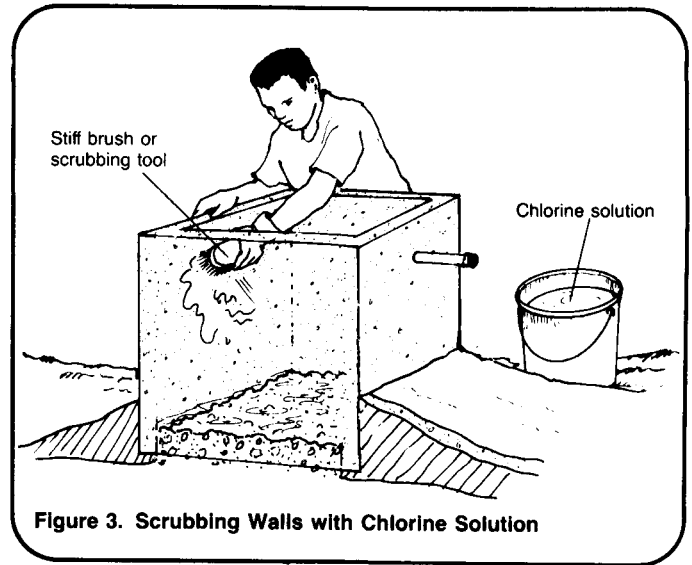


Figure 3. Scrubbing Walls with Chlorine Solution

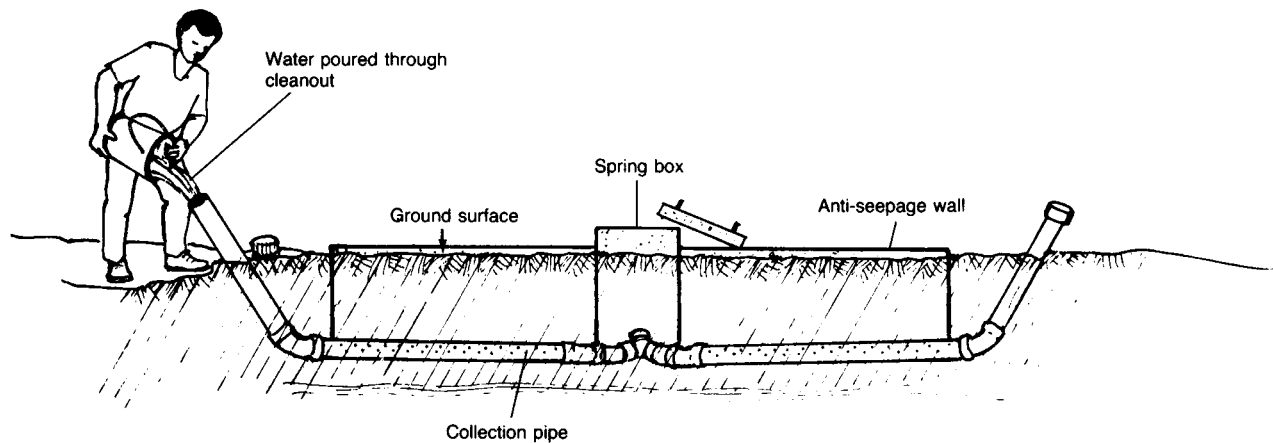


Figure 4. Flushing Out Seep Collection System